

Citation for published version:

Ruffle, S & Richens, P 2001, Web Based Consultation for Cambridge University's Building Program. in *Reinventing the Discourse - How Digital Tools Help Bridge and Transform Research, Education and Practice in Architecture: Proceedings of the Twenty First Annual Conference of the Association for Computer-Aided Design in Architecture*. ACADIA, pp. 366-371, Reinventing the Discourse - How Digital Tools Help Bridge and Transform Research, Education and Practice in Architecture [Proceedings of the Twenty First Annual Conference of the Association for Computer-Aided Design in Architecture], 1/01/01.

Publication date:
2001

[Link to publication](#)

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Web Based Consultation for Cambridge University's Building Program

Simon Ruffle
Cambridge University, UK

Paul Richens
Cambridge University, UK

Abstract

This two-year project is researching the web as a communications medium for better client-ship in the construction industry. The Martin Centre is developing a web site that presents Cambridge University's £500 million (\$700m) current building program to staff, students, alumni, and the citizens of Cambridge. Focussing on the University's master plans for the Sidgwick and West Cambridge teaching campuses, the project is in collaboration with the University Estate Management and Building Service (EMBS), General Board, West Cambridge Project Office, Sidgwick Site User Representatives, and the Press Office. The web site explains the University's development proposals in manner suited to readers with no building industry knowledge and offers an opportunity for consultative feedback. It is publicly available on the web at <http://www.cam.ac.uk/building>.

Keywords

Architecture, Urban Planning, Consultation Website, Masterplan

1 Introduction

Cambridge University has over 60 building projects valued between £35 million (\$50m) and £1 million (\$1.4m), and many smaller ones, with a total of £500 million (\$700m) currently in development. It is the largest building program in the history of the University. Much of this work is concentrated in four master plans: West Cambridge, Sidgwick Site, Addenbrookes Teaching Hospital, and NorthWest Cambridge.

West Cambridge and the Sidgwick Site (figure 1) are the focus of our project. West Cambridge is a large mainly green-field site to the west of the city of Cambridge where development of the University's physical sciences faculties, and related commercial high tech research, will take place over the next 20 years or so. The University has developed a master plan for the site, by architect Richard MacCormac, that has been granted planning permission and which is now being built. From January 2000 onwards, construction began of the Computer Laboratory, Microsoft Research Laboratory and the University Park and Cycle facility. The Sidgwick Site on the other hand (figure 2), much smaller and nearer the center of Cambridge, is the location of the University's Arts and Humanities faculties and was developed mainly in the 1950's and 60's to a master plan by Casson Conder. It features buildings by James Stirling and Norman Foster. The University's new master plan seeks to knit in new buildings to an existing urban fabric and rationalize the site infrastructure.

2 Cambridge University as a Client

The objectives of our project are to develop web publishing methods for master planning data, to establish web based feedback channels to encourage design participation, and to demonstrate web based communications as an aid to good client-ship in the construction industry. Our client is Cambridge University.

Cambridge University prides itself on its consultative, consensual tradition, where everyone has a right to be heard and the individual's right to freedom of expression is encouraged. However this can cause a problem of lack of coordination between different client-side groups typically in-

volved in the building process, such as benefactors, strategic planning committees, local departmental building committees, building users, and the "official" university client EMBS. The proposition of our project is to present clear up-to-date information about building proposals on a public web site with the opportunity for readers to feed back comments. By establishing a definitive resource to which all have signed up, we aim to overcome some of the problems of coordination. The university is a good place to research this, as most members are web literate.

The University promotes itself as a world-class institution and also sees the role of this web site as part of showing itself to be a substantial yet responsible builder with an eye to future benefaction, corporate collaboration and community relations.

3 The Web Site: Design Objectives

Before starting on the design of this web site we carried out a precedent study of university mas-

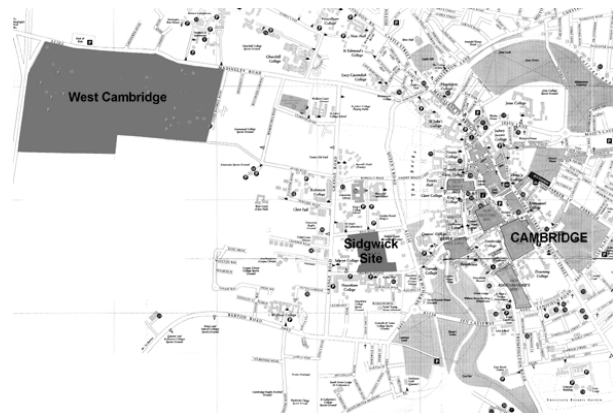


Figure 1. Location of West Cambridge and Sidgwick Site



Figure 2. The Sidgwick Site

ter plan web sites, of which there is a surprisingly large number, mostly in the US. It appears that the web suits the representation of master plans rather well, and we can hypothesize why this might be so:

- Master Plans have a political and funding role for the organization so their web presence tends to be well funded.
- Master Plans are targeted at a wide but diffuse audience. Organizations are attracted by the idea that the web site assists in publicizing the master plan.
- Master Plans have a long life during which they change only a little; they may exist long before actual construction starts and, even after work is complete, the master plan principles remain of interest.
- Drawings and information tend to be broad brush rather than intricate in detail so the simplicity of a web page with small raster pictures is well suited.
- Master Plans relate to other strategic information such as development policies, transport plans and local pressure group manifestos which are often web based themselves and can be readily linked to.
- Often Master Plans go hand in hand with consultation, which the web is well suited to handle. Public consultation on building proposals via the web may turn out to be easier than public meetings and mail-shots.

Armed with this background knowledge, along with experience of web site development from a previous project (Richens and Trinder, 1999), we established the design objectives for our web site as follows.

- **The Message:** Make it clear from whom the message comes, and to whom it is going. The University's decision to build comes from the very top. The flow of information that this web site is concerned with is primarily from the University to its members and back.
- **Be Definitive Source:** Be the place everyone comes to get information about the University's building plans. Have up to date accurate information and statistics always available.
- **Consultation:** This is the main reason people will visit the web site. Design of the consultation transaction is critical.
- **Virtual Reality:** We believe 3D VR representation offers benefits over 2D drawings when explaining design proposals to non-building professionals. Research how to incorporate VR into the web site whilst keeping it well integrated with the other information content and particularly with the consultation mechanism.
- **Appropriate Information Design:** Present the information on the web site in a clean, uncluttered, well-structured way with no gimmicks. The target audience is an intelligent, articulate group and the presentation of the information needs to reflect that. The web site

will be rich in images - drawings, maps, and photographs - which provide all the color and interest that is needed.

- **Web Page Technology:** Consider future maintainability of the web site, particularly if it is to continue to exist after the research project finishes (assuming hand over to EMBS).

4 The Web Site: Overview

The West Cambridge part of the web site went live in August 2000 and we merged it into University Planning and Building web site, along with Sidgwick, in June 2001. We negotiated a high-profile entry-point URL one level down from the top of the "Cam.ac.uk" domain (www.cam.ac.uk/building). The site is physically hosted within the Martin Centre using Microsoft's Windows NT based Internet Information Server (IIS).

The web site (figure 3) provides news items, site history, master plan background, current scheme proposals and latest development information. Like a brochure or magazine, information is published under editorial control. Images and text are edited and pages designed specifically for the target audience. This is distinctly different from web sites that are repositories of information, though this kind of capability will be added in future.

At key points in the web site, feedback forms allow readers to request further clarification or to raise areas of concern to the University. Comments received are stored in a relational database and are read and analyzed by designated University personnel. Web cams give up to the minute views of progress on site. Readers can take panoramic tours, and register to be kept up to date



Figure 3. Building and Planning Web Site Home Page

via email as to upcoming construction activities that may affect them. The home page gives information on general University building procedure and access to an on-line relational database of University building projects valued at over £1million (\$1.4m). This database is kept up to date monthly from EMBS statistics.

We studied the University's own guidelines for web pages and corporate communications and have used those guidelines where appropriate. The University crest brands every page, emphasizing their ownership of the information, as opposed to, say, the architects.

We adopted a "crushable" approach where whatever the width of the browser window the browser software will do its best to make all of the text and images visible. We felt this was appropriate in a university web site, as opposed to fixed-width used by many e-commerce sites. White space borders of 25 pixels are placed around images and paragraphs to give a calm relaxed look.

We researched web page languages and chose a mixture of HTML, Cascading Style Sheets (CSS) and JavaScript as the page-programming environment. This Client-Side Model is platform independent and compatible with CDROM delivery, which we find useful. Pages are tested on a variety of operating system/browser/version combinations and are checked with an on-line HTML/CSS validator. On the server side, databases are Microsoft Access and active server pages (ASP) provide automation such as email auto-response. Other server processes, such as web cam management, are coded in Microsoft Visual Basic.

5 The East Forum Consultation

The first consultation on the web site was for the East Forum on the West Cambridge Site. In August 2000 the Council of the University decided to consult its members on proposals for the East Forum development and wanted to use a web-based approach to do this. This was the first time Cambridge University General Board had used web-based consultation.

We set up a bulletin board on the web site (figure 4) to record discussion about the scheme, which ran until 20th October 2000 and a total of 55 comments were recorded. A disappointment with the

consultation was that the discussion concentrated on basic personal issues like cycling and parking and there was no discussion of larger planning themes. We have interviewed some of the correspondents to the bulletin board and have these possible explanations:

- Cycling and parking obsess Cambridge residents.
- Most of the ultimate users of the East Forum facilities, the people who really will be affected by the design, do not yet work on the West Cambridge site so it was too far removed for them to feel involved.
- A simple bulletin board is not directed enough. A questionnaire might have been better.

However, the web-based consultation did raise genuine criticisms of the East Forum outline design from members of the University. These criticisms were accepted by the University's project manager and were submitted to the architects as part of a revised briefing process for the East Forum that took place in the October/November 2000 period. It can be concluded that this was a small but effective application of web based consultation.

6 The Sidgwick Site Consultation

In January 2001 we were asked by EMBS to make a web site to present the Sidgwick Site master plan, which was due to apply for planning permission over Summer 2001. As a teaching campus used daily by about 4,000 staff and students the level of interest in the development proposals is considerably higher than West Cambridge.

The Site
The Master Plan
Pictures
Webcams
Transportation
Ecology
Web Consultation
Archaeology
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PAGE

East Forum and East Square Development

The East Forum and East Square Development consists of three distinct elements - the East Square, Residential/Nursery, and the East Forum, each with different parameters for funding and programme. Together they form a significant development of infrastructure on the West Cambridge site and will serve to establish standards for future development. The East Forum is one of the two main social centres on the West Cambridge site, and the East Square is a major open space. The University Council has invited consultation on the East Forum element of the development.

East Forum and East Square Development Location

The East Forum and East Square Development is located on the south edge of West Cambridge, next to the Cavendish Laboratory. At the moment it is at the edge of current development at West Cambridge but ultimately it will be one of the busiest areas of the site. The design has to resolve conflicting movements of vehicles, pedestrians and cyclists, and signal the importance of the Forum as a

Fast Links
[Record your Comments Now](#)
[See Reporter Article](#)

East Forum & East Square Outline Proposals

Site area	20,361 sq m
Shops/Catering	2,427 sq m
Residential (north of East Square)	58 2-3 bed flats
Nursery Places	84
Entrepreneurship and related facilities	3,800 sq m approx
East Square car spaces	165

Figure 4. Part of the East Forum Page, August 2000

Unlike the free, open form of consultation of the East Forum, for Sidgwick we worked closely with the User Representatives to develop a questionnaire. It was decided that we were not seeking opinions; the design was in the hands of professionals. Rather we were doing our best to be clear as to the University's intentions and as such we would be prepared to clarify those intentions if readers felt clarification was needed. In addition the University was open to any reader who had a genuine concern about the proposals. This led to the design of a series of on-line questionnaires (figure 5) which give the reader the opportunity to request clarification, and to voice areas of concern, but not to give freely of their opinion. We felt this was a fair approach. Submitted comments cannot be read by other web site visitors, and are stored in a relational database for analysis by EMBS and the Site User Representatives. In due course Frequently Asked Questions (FAQ) style pages will be produced to answer this feedback, as appropriate. This will be the predominant mode of response to feedback.

7 Web Cams

Five web cams have been live at West Cambridge since the web site became operational and can be viewed at any time on the web site (figure 6). We now have an archive of progress that in due course will show construction from empty field to completed building, at 15 minute intervals. The web cams demonstrate that the web site is live, though

Master Plan Feedback

We welcome your feedback on the Master Plan.

Would you like further clarification of any aspect of the Master Plan? If so, please give details here.

Do you have any area of concern about the Master Plan you would like to raise to the University? If so, please give details here.

Your Name*

Your e-mail address*

Department (if member of Cambridge University)

Home Postcode (uk residents only)

Click this button to send feedback

* = required

Figure 5. One of the Sidgwick Site questionnaire pages

their low resolution is a barrier to their full use as a site-monitoring tool. Movies made of progress on site have proved effective.

8 Drawing for the Web

Drawings are an important part of a web site that presents building proposals and as the target audience is made up of people who are not building professionals, they need to be simple and clear. Drawings need to be:

- Derived from consultants' CAD drawings
- Layered, allowing a variety of drawings to be created from the base
- Displayed in GIF or JPG format on web pages at a size of between 300 and 600 pixels width and not to require any kind of "plug in" viewer.
- Limited in size and color palette to reduce download time

To create a drawing of a site 1 km wide that can still be readable when 600 pixels wide implies a simple diagrammatic style (figure 7). Buildings are drawn as simple block polygons with a fill color representing the degree of design completion from gray (at master plan stage only) through a sequence of colors of increasing red-ness to dark red (built). Shadows help to indicate the three-dimensionality of the buildings and larger foliage. The base drawing allows the production of variety of explanatory drawings and diagrams (figure 8).

We learnt early on that, in general, consultants' scale drawings cannot be used on web pages as they are originally drawn for presentation on much higher resolution media (paper, for example). To get the best results for a web drawing,



Figure 6. Web Camera Image of Microsoft Research Laboratory under construction, 22nd June 2001

it needs to be drawn specifically for the web. Consultants naturally feel this is not their job so it has ended up with many key drawings being redrawn by us.

9 Observations

As our research involves a real life project, we have to respond to real delays and deadlines and interact with a wide group involved in the University building program. Our role has a large element of information journalism and we have to proactively seek out information.

Some emerging attitudes to our web site are interesting. A few consultants have embraced the web site as an on-line interactive showcase for their work, but the majority view it with suspicion and are slow to provide information. They seem paranoid about design information being published that they deem unready for public con-

sumption, and dislike having their designs put up for public comment. On the other hand, some web site readers tend to be cynical; believing that they are being presented with foregone conclusions, and that the University authorities will ignore comments made via the web site. However, the passions raised in some quarters by our web site do indicate the perceived power of the medium, though there are clearly limits to how far this technology can go to solve problems of University politics.

On the whole, the web site has been well received by the target audience and many favorable comments made. It has been well visited; in the first week of the Sidgwick consultation there were 500 visitors viewing on average 5 pages each.

10 Program for Next 6 Months

- Assess the impact and effectiveness of the current Sidgwick Site consultation.
- Research the issue of web site maintainability, particularly for when the research project finishes. Assess how web development software packages may assist.
- Move into 3D. Research representational and consultative technologies in 3D including on-line virtual reality, panoramic montages and isometric techniques.
- Add a Project Extranet type on-line drawing and document repository.
- Present to EMBS the opportunity that the web site offers to them.

Sponsors and Collaborators

This project is sponsored by the UK Engineering and Physical Sciences Research Council (EPSRC) under their Innovative Manufacturing Initiative. Academic collaborators are Cambridge University Moving Image Studio (CUMIS) and Anglia Polytechnic University.

Industrial Collaborators are Cambridge University Estate Management Building Service (EMBS); Cambridge University General Board; MacCormac Jamieson Prichard; RMJM London Ltd; Microsoft Research UK; TP Bennett; McQuitty Landscape Design; Informatix Inc.

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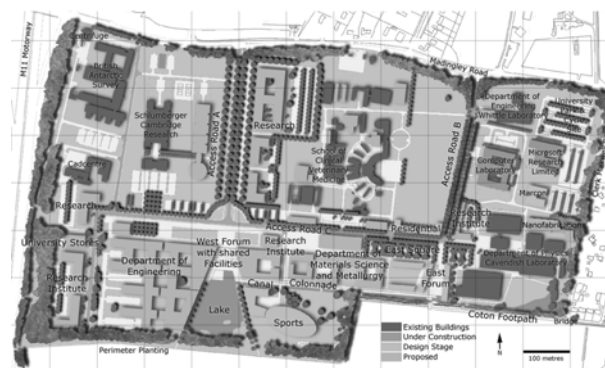


Figure 7. West Cambridge Master Plan Drawing

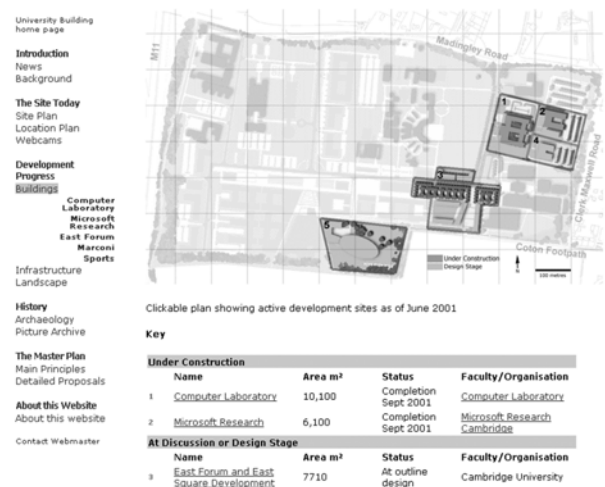


Figure 8. Web page showing drawing derived from base master plan